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10/523,778	10/20/2005	Tsukasa Taniguchi	056205.55926US	5729

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EXAMINER
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JACOBS, DUSTIN THOMAS

ART UNIT	PAPER NUMBER
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2834

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07/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/523,778

Applicant(s)

TANIGUCHI ET AL.

Examiner

Dustin Jacobs

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 02/08/2005 and 05/23/2007.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. Japan 2002-232264, filed on 08/09/2002.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Gleghorn et al. (US Patent 4,922,152) and Takano et al. (US Publication 2002/0074887).

Gleghorn et al. '152 discloses:

- A rotating electric machine (col. 1, line 11) having a stator provided with a plurality of windings. It is inherent that the motor of Gleghorn must have a stator with a plurality of stator windings, as seen in Takano et al. '887, otherwise the machine/motor will not work.
- A rotor core (10, Fig. 4) rotatably fixed on a rotary shaft (16, Fig. 4) inside said stator.
- A plurality of magnets (14 and 18, Fig. 4) disposed in slots (12 and 14, Fig. 4) in said rotor core.
- Among those ones of said plurality of magnets constituting one magnetic pole (18, 14, 18, Fig. 4), the magnet arranged on the magnetic pole end side (18, Fig. 4) is oriented to incline toward a magnetic pole center position.

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In re claim 4, a circular arc passing the centers of the magnets among those ones of said plurality of magnets constituting a pole has a smaller diameter than a circular arc passing the center of the magnet (14, Fig. 4) there among arranged on the magnetic pole center side.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. (US Patent 4,922,152) in view of Inayama et al. (US Publication 2002/0171308).

Gleghorn et al. '152 discloses:

- A rotating electric machine (col. 1, line 11) having a stator (Stator must be present for the machine to work) provided with a plurality of windings and a rotor core (10, Fig. 4) rotatably supported on a rotary shaft (16, Fig. 4) inside said stator.
- A plurality of magnets (14 and 18, Fig. 4) disposed in slots (12 and 14, Fig. 4) in said rotor core.

Gleghorn et al. '152 does not explicitly disclose:

- A circumferential angle of the one magnetic pole in the range of 150 to 165 degrees in terms of an electrical angle.

Inayama et al. '308 discloses:

- A stator (2, Fig. 2) with a plurality of windings (par. 30, lines 4-5).
- A result effective motivation of providing a desired electrical angle for the magnetic pole (par. 11, lines 4-15).

Gleghorn et al. '152 discloses the claimed invention except for a circumferential angle of the one magnetic pole in the range of 150 to 165 degrees in terms of an electrical angle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a circumferential angle of the one magnetic pole in the range of 150 to 165 degrees in terms of an electrical angle, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. Inayama et al. '308 discloses that a certain optimum range for the opening electrical angle of the magnetic pole will allow mutual antiphase for the magnetic and salient poles (par. 11, lines 4-15), and thus reduce cogging torque without sacrificing the electrical characteristics. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 and Takano et al. '887 as applied to claim above, and further in view of Mita et al. (US Patent 5,684,352).

Gleghorn et al. '152 discloses:

- The magnet (18, Fig. 4) arranged on the magnetic pole end side is oriented to incline toward the magnetic pole center (14, Fig. 4) such that an angle is formed

between said magnet and a line tangential to a point at which a straight line passing both the center of said rotary shaft and the center of said magnet crosses an outer circumferential surface of said rotor core.

Gleghorn et al. '152 does not explicitly disclose:

- The angle being in the range of 2 to 6 degrees.

Mita et al. '352 discloses:

- An optimum range and value for the angle of the magnet at the side of the pole in respect to the radius of the rotor or the straight line passing both the center of the shaft and the center of the outer circumference of the magnet. Angle Theta of Figure 3 and column 12, lines 34-36 and 41-43 disclose that the advantage of the changing of the angle the effective flux amount per magnetic pole can be freely varied.

Gleghorn et al. '152 discloses the claimed invention except for an optimum range and value for the angle of the magnet at the side of the pole being in the range of 2 to 6 degrees. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an optimum range and value for the angle of the magnet at the side of the pole being in the range of 2 to 6 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. Mita et al. '352 discloses the benefits of providing a range for the angle of the outer circumference of the magnet in respect to the radius of the rotor. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In re claim 4, Gleghorn et al. '152 discloses a circular arc passing the centers of the magnets among those ones of said plurality of magnets constituting a pole has a smaller diameter than a circular arc passing the center of the magnet (14, Fig. 4) there among arranged on the magnetic pole center side.

6. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 in view of Inayama et al. '308 as applied to claim 1 above, and further in view of Tajima et al. (US Patent 6,208,054).

Gleghorn et al. '152 discloses:

- Slits (22, Fig. 4) at opposite ends of the magnetic pole (14 and 18, Fig. 4).

Gleghorn et al. '152 in view of Inayama et al. '308 does not disclose:

- Slits are formed between adjacent two of said plurality of magnets.

Tajima et al. '054 discloses:

- Slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2).

The advantage of Tajima et al. '054 is to provide the gradual change of the magnetic flux density distribution (col. 8, lines 40-43).

Tajima et al. '054 teaches that it is known to provide slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2) as taught by Tajima et al. '054, since Tajima et al. '054 states that such a

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modification would provide the gradual change of the magnetic flux density distribution (col. 8, lines 40-43).

In re claim 7, Tajima et al. '054 discloses a magnet fixing material (col. 9, lines 40-44).

7. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 and Takano et al. '887 as applied to claim 2 above, and further in view of Tajima et al. '054.

Gleghorn et al. '152 discloses:

- Slits (22, Fig. 4) at opposite ends of the magnetic pole (14 and 18, Fig. 4).

Gleghorn et al. '152 and Takano et al. '887 do not explicitly disclose:

- Slits are formed between adjacent two of said plurality of magnets.

Tajima et al. '054 discloses:

- Slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2).

The advantage of Tajima et al. '054 is to provide the gradual change of the magnetic flux density distribution (col. 8, lines 40-43).

Tajima et al. '054 teaches that it is known to provide slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide slits (14, Fig. 2) formed between adjacent two of said plurality of magnets (9, Fig. 2) as taught by Tajima et al. '054, since Tajima et al. '054 states that such a



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modification would provide the gradual change of the magnetic flux density distribution (col. 8, lines 40-43).

In re claim 7, Tajima et al. '054 discloses a magnet fixing material (col. 9, lines 40-44).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 in view of Inayama et al. '308 as applied to claim 1 above, and further in view of Takano et al. (US Publication 2002/0074887).

Gleghorn et al. '152 in view of Inayama et al. '308 does not explicitly disclose:

- The magnet is in the form of a simple flat plate.

Takano et al. '887 discloses:

- A magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9).

The advantage of Takano et al. '887 is to permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

Takano et al. '887 teaches that it is known to provide a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9) as taught by Takano et al. '887, since Takano et al. '887 states that such a modification would permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 and Takano et al. '887 as applied to claim 2 above, and further in view of Takano et al. '887.

Gleghorn et al. '152 does not disclose:

- The magnet is in the form of a simple flat plate.

Takano et al. '887 discloses:

- A magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9).

The advantage of Takano et al. '887 is to permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

Takano et al. '887 teaches that it is known to provide a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9) as taught by Takano et al. '887, since Takano et al. '887 states that such a modification would permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

10. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Gleghorn et al. '152 in view of Takano et al. '887 and Mita et al. '352 as applied to claim 3 above, and further in view of Takano et al. '887.

Takano et al. '887 discloses:

- A magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9).

The advantage of Takano et al. '887 is to permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

Takano et al. '887 teaches that it is known to provide a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to a magnet (53, Fig. 5) in the form of a simple flat plate (par. 44, lines 8-9) as taught by Takano et al. '887, since Takano et al. '887 states that such a modification would permit a much lower cost without decreasing the efficiency of the machine (par. 48, lines 9-12).

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Takano et al. (US Publication 2002/0074887) reads on almost all of claim 1. Koharagi et al. (US Publication 2002/0047434) discloses a case law reference for optimum value for the pitch angle range/electrical angle of the magnetic pole. Nagate et al. (US Patent 5,864,191) discloses the permanent magnets being plate-like. Mikulic (US Patent 5,097,166) discloses rotor core with inclined permanent magnets towards the magnetic pole center with slits on the adjacent side magnets.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dustin Jacobs whose telephone number is 571-270-1429. The examiner can normally be reached on M-Th, 7:30am-5:00pm est.; alternate Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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